

# PATENT ABSTRACTS OF JAPAN

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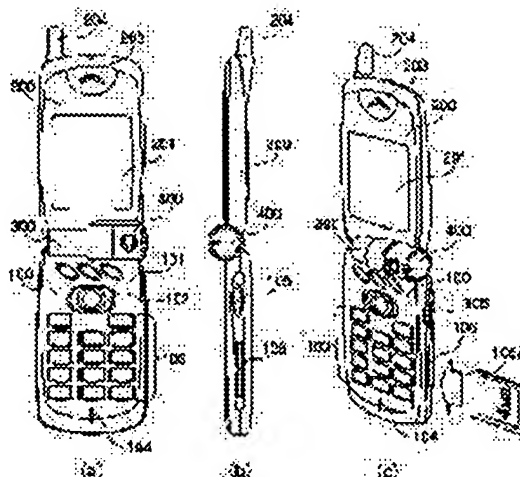
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(54) PORTABLE RADIO COMMUNICATION EQUIPMENT

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a portable radio communication equipment with image pickup function, where an image pickup camera itself can be removed, an image pickup range is enlarged and a call can be realized while image information of an extended memory card and image information from a personal computer are transmitted and received.

SOLUTION: A camera body part 400 is removably stored in a hinge part 300 connecting a telephone set body part 100 and a cover part 200 so that they can be folded. When the camera body part 400 is separated, a video signal is transmitted to the telephone set body part 100 via the hinge part 300 by an optical communication means.



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CLAIMS

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[Claim(s)]

[Claim 1] The pocket mold radio communication equipment characterized by providing the hinge region connected possible [ folding of the body section of telephone which has the communications department which transmits and receives an image and a sound signal, and an input control unit, the covering device which has a display means, and said body section of telephone and said covering device ], and the camera unit for an image image pick-up prepared in said hinge region disengageable.

[Claim 2] Said camera unit for an image image pick-up is a pocket mold radio communication equipment according to claim 1 characterized by the ability to carry out adjustable [ of the image image pick-up direction ] in the condition that the body section of said telephone with which it was folded up, and said covering device were opened.

[Claim 3] It is the pocket mold radio communication equipment according to claim 1 or 2 characterized by for said camera unit for an image image pick-up possessing the optical transmitting means for transmitting the picturized image data signal to said hinge region, and said hinge region possessing the optical receiving means for receiving the image data signal transmitted from said camera unit for an image image pick-up.

[Claim 4] The pocket mold radio communication equipment according to claim 3 with which the optical-communication means for transmitting the picturized image data signal to said hinge region from said camera unit for an image image pick-up when said camera unit for an image image pick-up dissociates from said hinge region and is arranged is characterized by being an optical fiber.

[Claim 5] Said body section of telephone is a pocket mold radio communication equipment given in either of claim 1 to claims 4 characterized by forming the insertion means of an expanded memory in the side face of the case.

[Claim 6] Said body section of telephone is a pocket mold radio communication equipment given in either of claim 1 to claims 5 characterized by preparing connection NTAFESU to an external personal computer in the side face of the case.

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## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the pocket mold radio communication equipment with an image pick-up function whose transmission and reception of an image and voice data are enabled:

[0002]

[Description of the Prior Art] Recently, an image-processing circuit is sharply integrated by the advance of LSI technology, a miniaturization and low-power-ization are attained, and the product of the pocket mold by cordless-izing has been developed also in a TV phone machine. In the case of such a pocket mold, the structure which unified the telephone member for the alphabetic character and the micro CCD camera for the small liquid crystal display and image pick-up for the display of an image is taken.

[0003] For example, the walkie-talkie type TV telephone is proposed by JP, 6-292197, A. In this walkie-talkie type TV telephone, the whole equipment is equipped with the flip section connected with the hinge, it changes into the condition of having laid on top of the top face of the body of equipment with said hinge, and this flip section can be closed. The top face of the body of equipment is equipped with the monitor, the CCD camera, and the loudspeaker. It talks over the telephone with a microphone, maintaining a fixed distance toward the aforementioned monitor, a CCD camera, and a loudspeaker, and checking a monitor by looking, when the flip section is opened.

[0004] Moreover, the cellular-phone one apparatus video camera is proposed by JP, 8-294030, A. This cellular-phone one apparatus video camera carries in a case the video camera section which consists of an image pick-up lens and an image sensor, the graphic display section, and the cellular-phone function part which carries out the wireless transmission and reception of the message signal of a telephone.

[0005] Furthermore, the following two cases are indicated as the method of disposition of each of said component in a case.

[0006] While it consists of the 1st case which carries the loudspeaker of the video camera section and a cellular-phone function part, and the 2nd case carrying the microphone of the graphic display section, a control unit, and a cellular-phone function part in the case of the 1st and the 1st case is supported to revolve by the 2nd case pivotable centering on the horizontal axis of the 2nd case, the loudspeaker of the video camera section carried in the 1st case and a cellular-phone function part is a configuration arranged mutually in the location which carries out an abbreviation rectangular cross.

[0007] While consisting of a top case carrying the loudspeaker and microphone of the video camera section, the graphic display section, and a cellular-phone function part, and a control unit and the bottom case carrying a dc-battery in the case of the 2nd and connecting a top case and a bottom case rotatable, when a top case is rotated and it blockades, the field where the video camera section of a top case and the graphic display section were arranged is superimposed on the top face of a bottom case. The pocket mold TV phone is proposed by JP, 9-327007, A further again. Two configurations are indicated by this proposal. With the 1st configuration, the camera for an image image pick-up was formed disengageable to the body of equipment, and while establishing the optical-communication means for transmitting and receiving image data between the body of equipment, and the camera unit for an image image pick-up,

the image delivery system for projecting an image on the body of equipment and the projection direction adjustable means for carrying out adjustable [ of the direction which projects an image by the image delivery system ] are established in one. Moreover, the camera for an image image pick-up forms disengageable to the body of equipment, and while establishing the optical-communication means for transmitting and receiving image data between the body of equipment, and the camera unit for an image image pick-up, with the 2nd configuration, the direction adjustment device of a camera which makes in agreement the optical axis of the camera for an image image pick-up in the direction with the body of equipment, and the angle-of-visibility adjustment device which make in agreement the core of the angle of visibility of the image-display section in the direction with the body of equipment prepare.

[0008]

[Problem(s) to be Solved by the Invention] However, when the flip section is opened in the case of what is indicated by JP,6-292197,A etc., it talks over the telephone with a microphone, maintaining a fixed distance toward a monitor, a CCD camera, and a loudspeaker, and checking a monitor by looking, but since the CCD camera is arranged on the front face of the flip section, the situation where the other location must be changed into a CCD camera according to the aperture condition of the flip section produces a user. Moreover, when it was going to picturize objects other than a user's image, the whole equipment had to be operated for turning a CCD camera to an object, therefore there was a problem of being hard coming to carry out a message.

[0009] Moreover, in the case of what is indicated by JP,8-294030,A etc., with the 1st configuration, there was a problem of becoming complicated, also from the field of device design that the location of the microphone to be used and a loudspeaker changes according to the image pick-up direction of a camera, or operability.

[0010] Moreover, when the 2nd configuration opens a top case by the hinge region to a bottom case, the configuration by which the video camera section and the graphic display section are arranged on the top face of a top case is fundamentally the same as that of the case of JP,6-292197,A, and produces the same problem.

[0011] In the case of what is indicated by JP,9-327007,A etc., with the body of equipment, the camera unit is prepared in another object and the time and effort that it must carry with another object with the main frame will produce it further again at the time of carrying. Moreover, if a camera unit is held in the same case as the graphic display section and wearing of it in a part of a user's body is enabled, it cannot but stop miniaturizing the graphic display section to some extent, and will become hard to see.

[0012] It was made in order to solve the above problems, and a user doubles the image pick-up direction of a camera with a camera from the front to back in the other location, and this invention can be easily carried out by adjustment. By making the camera itself dismountable from the body of equipment, the image pick-up range of an image pick-up camera is expanded, and it aims at offering the pocket mold radio communication equipment which makes a message possible, transmitting and receiving [ it not only transmitting and receiving a user's image, but ] the image of a surrounding situation, goods, a document, etc.

[0013]

[Means for Solving the Problem] it have the configuration characterize by provide the camera unit for an image image pick-up prepared disengageable to the hinge region which connect the pocket mold radio communication equipment of this invention possible [ folding of the body section of telephone which have the communications department which transmit and receive an image and a sound signal , and an input control unit , the covering device which have a display means , and said body section of telephone and said covering device ] , and said hinge region in order to solve this problem .

[0014] By this configuration, by having prepared the camera unit for an image image pick-up in the hinge region connected possible [ folding of the body section of telephone, and a covering device ] disengageable, it becomes unnecessary to newly prepare the device member for attaching the camera unit for an image image pick-up, enabling free rotation in the body section of telephone, or a covering device, and simplification of a configuration can be attained. Moreover, the image pick-up range of the camera unit for an image image pick-up is extensible by having prepared the camera unit for an image

image pick-up disengageable from the hinge region.

[0015] It has the configuration to which the pocket mold radio communication equipment of this invention is characterized by the ability to carry out adjustable [ of the image image pick-up direction ] in the condition that the body section of said telephone with which said camera unit for an image image pick-up was folded up, and said covering device were opened.

[0016] When a covering device is opened by this configuration, it becomes possible to set up the image pick-up direction of the camera unit for an image image pick-up in the optimal direction, checking the display situation of the partner display screen with a message partner, after the display screen has made the covering device the legible include angle.

[0017] The pocket mold radio communication equipment of this invention possesses the optical-communication means for transmitting the picturized image data signal to said hinge region, and said hinge region has the configuration characterized by providing the optical-communication means for receiving the image data signal transmitted from said camera unit for an image image pick-up.

[0018] It also becomes possible to talk over the telephone, the image pick-up range of the camera unit for an image image pick-up being expanded, and transmitting [ it not only transmitting and receiving a user's image but ] the image of a surrounding situation, goods, a document, etc. by this configuration.

[0019] The pocket mold radio communication equipment of this invention has the configuration in which the optical-communication means for transmitting the picturized image data signal to said hinge region from said camera unit for an image image pick-up considers as the description that it is fiber optics communication, when said camera unit for an image image pick-up dissociates from said hinge region and is arranged. *(fiber optics)*

[0020] When said camera unit for an image image pick-up dissociates from said hinge region and is arranged by this configuration, no matter it may turn the image pick-up direction of said camera unit for an image image pick-up in what direction, picture signal transmission of low loss can be performed in a broadband.

[0021] It has the configuration in which the pocket mold radio communication equipment of this invention considers as the description that said body section of telephone formed the insertion means of an expanded memory in the side face of the case.

[0022] It can talk over the telephone, making said expanded memory memorize image information or text information, and displaying image information required at any time or text information on the pocket mold radio communication equipment of the other party by this configuration. *(store image)*

[0023] It has the configuration in which the pocket mold radio communication equipment of this invention considers as the description that said body section of telephone prepared connection NTAFESU to an external personal computer in the side face of the case.

[0024] By this configuration, the image information transmitted from the pocket mold radio communication equipment of the other party can be transmitted to the memory of an external personal computer, and preservation and edit arrangement can carry out. Moreover, it becomes possible to transmit to the other party at any time, transmitting the image information held in an external personal computer to said expanded memory, or talking over the telephone.

[0025]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained to a detail using a drawing.

[0026] (Gestalt of the 1st operation) The case where the body section 400 of a camera is used in the condition of having held in the body section 100 of telephone, as a gestalt of the 1st operation is explained.

[0027] Drawing 1 is drawing showing the condition of having opened the covering device of the pocket mold radio communication equipment with an image pick-up function in the gestalt of the 1st operation by this invention. Drawing 1 (a) is a top view, drawing 1 (b) is a side face and drawing 1 (c) is a perspective view.

[0028] The pocket mold radio communication equipment with an image pick-up function of the gestalt of this operation is connected possible [ folding / hinge region / 300 ] for the body section 100 of

telephone, and a covering device 200. It combines with the hinge rotation shaft of a hinge region 300 disengageable, and the body section 400 of a camera is attached. In the body section 100 of telephone, two or more function keys 101 are arranged at hinge region 300 approach, and the scrolling key 102 is arranged under it. Furthermore, the input control unit 103 which changes from two or more actuation keys containing a dialing key to the scrolling key 102 bottom is arranged, and the microphone 104 is formed in the bottom of it.

[0029] Moreover, drawing 1 (b), And as shown in drawing 1 (c), an electric power switch 105 and the slot 106 for extended memory cards are formed in one side face of the body section 100 of telephone, and the slot for personal computer connection (not especially shown) is prepared in the side face of another side.

[0030] The image picturized by the inside in the body section 400 of a camera and the liquid crystal display section 201 which displays the text at the time of telephone actuation, the loudspeaker 203, and the antenna 204 are formed in the covering device 200.

[0031] Drawing 2 shows cross-section structural drawing of the hinge region 300 in the gestalt of the 1st operation by this invention, drawing 2 (a) is cross-section structural drawing seen from the transverse plane, and drawing 2 (b) is cross-section structural drawing seen from the side face.

[0032] Hereafter, the hinge region 300 connected possible [ folding of the body section 100 of telephone and a covering device 200 ] consists of the lightwave signal receiving-circuit sections 303 built in the hinge rotation shaft 301, the lightwave signal receiving-circuit section case 302 which carries out checking-and-verifying insertion at it, and the lightwave signal receiving-circuit section case 302 so that drawing 2 may explain. Furthermore, the body section 400 of a camera joins together disengageable, and is attached in the hinge region 300.

[0033] As shown in drawing 2, a hinge region 300 consists of [ the amount of / of the bell shape hinge rotation shaft 301 and the hinge rotation shaft 301 / centrum ] lightwave signal receiving-circuit section cases 302 by which checking-and-verifying insertion is carried out. The lightwave signal receiving-circuit section 303 (O/E) which changes from a photo detector, optical -> electrical signal conversion circuit, an amplifying circuit, and a demodulator circuit to the light-receiving circuit section case 302 is arranged. Furthermore, checking-and-verifying insertion of the camera case 401 of the body section 400 of a camera is carried out at the lightwave signal receiving-circuit section case 302. As the camera case 401 is shown in drawing 2, it consists of partial 401a with large aperture, and small partial 401b, and checking-and-verifying insertion of the partial 401b with small aperture is carried out at the lightwave signal receiving-circuit section case 302. In the condition that checking-and-verifying insertion was carried out at the lightwave signal receiving-circuit section case 302, the camera case 401 is rotatable around the common medial axis of the hinge rotation shaft 301, the light-receiving circuit section case 302, and the camera case 401, and can set up the image pick-up direction of the image pick-up lens which the body section of a camera carries out below-mentioned 400 by it in the direction of the arbitration which intersects perpendicularly with said common medial axis. As for the body section 400 of a camera, an image sensor 402 is fixed to the interior of the shape of a cavity of partial 401a with the large aperture of the camera case 401, and the image pick-up lens 403 is inserted in the hole formed in the peripheral wall of the camera case 401. On the other hand, inside the shape of a cavity of partial 401b with the small aperture of the camera case 401, a modulation circuit, electric -> lightwave signal conversion circuit, and the lightwave signal sending-circuit section 404 (E/O) that consists of a light emitting device arrange. Therefore, after the photographic subject image caught with the image pick-up lens 403 is projected on an image sensor 402 and changed into an electrical signal, it is sent to the lightwave signal sending-circuit section 404, and it becomes a lightwave signal again. Light is received by the photo detector of the lightwave signal receiving-circuit section 303, and this lightwave signal is changed into an electrical signal, and is transmitted to the body section 100 of telephone as a picture signal. In addition, the body section 400 of a camera builds in the cell 405 as a power source in the case of removing and using it from the lightwave signal receiving-circuit section case 302 so that it may mention later.

[0034] Drawing 3 is the block diagram showing the whole pocket mold radio-communication-



equipment configuration with an image pick-up function in the gestalt of the 1st operation by this invention.

[0035] The body section 100 of telephone The function key section 101, the scrolling key 102, the input control unit 103, a microphone 104, the slot 106 for extended memory cards, extended memory card 106a, An internal memory 107, the interface 108 for personal computer connection, the central-process section 109, the signal distribution control section 110, the voice and image multiplex / decomposition circuit 111, the baseband signaling processing section 112, the strange demodulator circuit 113, the RF circuit 114, the speech compression / expanding circuit 115, a voice codec circuit ((codec) Voice) It consists of 116, picture compression / expanding circuit 117, and image buffer memory 118. In addition, the central-process section 109 consisted of microcomputers equipped with CPU, ROM, RAM, etc., and controls each part of a pocket mold radio communication equipment with this image pick-up function.

[0036] A function key 101 and the scrolling key 102 are used for the menu manipulation in non-voice service functions other than a telephone function (for example, telephone number \*\*\*\*\* and registration, an electronic mail, Internet access, etc.) etc.

[0037] A covering device 200 consists of the liquid crystal display section 201, a display drive circuit 202, a loudspeaker 203, and an antenna 204.

[0038] As drawing 2 explained the hinge region 300, it consists of a hinge rotation shaft 301 connected possible [ folding of the body section 100 of telephone, and a covering device 200 ], and a lightwave signal receiving-circuit section case 302 which carries out checking-and-verifying insertion at it, and the lightwave signal receiving-circuit section (O/E) 303 is built in the lightwave signal receiving-circuit section case 302. Furthermore, through the lightwave signal receiving-circuit section case 302, the body section 400 of a camera joins together disengageable, and is attached in the hinge region 300.

[0039] When using the body section 400 of a camera, dissociating from the body section 100 of telephone, the body section 400 of a camera and the body section 100 of telephone are connected with the fiber-optic cable 500 mentioned later.

[0040] Next, the transceiver actuation of the sound signal and picture signal of a pocket mold radio communication equipment with an image pick-up function in the gestalt of the 1st operation by this invention is explained. If call origination actuation of a TV phone inputs the partner telephone number and then the depression of the initiation key (arranged at the input control unit 103 although not illustrated especially) is carried out by the dialing key of the input control unit 103, the central-process section 109 detects that call origination actuation occurred, and it sends out a call connection command signal to the communications control section 110. If the communications control section 110 sends out the call connection information signal containing the telephone number to the baseband signaling processing section 112, it will be transmitted to the strange demodulator circuit 113 in response to error correction processing, channel coding processing, etc. here. Mixing of the call origination information modulated in the strange demodulator circuit 113 is carried out by the RF signal in the RF circuit 114, and it is transmitted to the base station by the side of a dial office from an antenna 204 as an electric-wave signal. Hereafter, although it becomes actuation of the pocket mold radio communication equipment with an image pick-up function of the other party, explanation of operation uses drawing 3. If the pocket mold radio communication equipment with an image pick-up function of the other party receives the electric-wave signal from the base station by the side of a dial office in the RF circuit 114 through an antenna 204 and it detects that it is reception to a local station, it will be sent to the strange demodulator circuit 113 as a call connection information signal. The call connection information signal to which it restored in the strange demodulator circuit 113 is at the baseband signaling processing section 112. If it is changed into a digital signal, and is sent to the communications control section 110 and it is judged that it is a call in, a call-in signal will be sent to the central-process section 109. The central-process section 109 is called from a loudspeaker 203, and generates a sound. If the other party user does the depression of the initiation key of the input control unit 103 to this call sound, the central-process section 109 will transmit a reply signal to the base station by the side of a dial office via the communications control section 110, the baseband signaling processing section 112, the strange demodulator circuit 113, and the RF circuit 114. The circuit-switched-connection root of the exchange is

*Telephone*



secured at the same time it judges with call connection having been established between the call origination side and the call-in side in the base station of a dial office and transmits the reply signal of call establishment to a call origination and call-in side by this. Thus, the communication link of a message and an image is attained.

[0041] The sound signal from a microphone 104 is digitized by the voice codec 116, is compressed in speech compression / expanding circuit, and is sent to voice and image multiplex / decomposition circuit 111. On the other hand, the video signal from the body section 400 of a camera is compressed in picture compression / expanding circuit 117, and is inputted into voice and image multiplex / decomposition circuit 111 via the signal distribution control circuit 110. It multiplexes in voice and image multiplex / decomposition circuit 111, becomes voice and an image multiplexed signal, goes into the baseband signaling processing section 112, and is transmitted to the base station by the side of a dial office as an electric-wave signal from an antenna 204 via the strange demodulator circuit 113 and the RF circuit 114, and the compressed digital sound signal and the compressed video signal are further transmitted to the pocket mold radio communication equipment with an image pick-up function of the other party. In the pocket mold radio communication equipment with an image pick-up function of the other party, if an antenna 204 receives the electric-wave signal of voice and an image multiplexed signal, it will input into voice and image multiplex / decomposition circuit 111 via the RF circuit 114, the strange demodulator circuit 113, and the baseband signaling processing section 112, and will decompose into a sound signal and a video signal. It is elongated in speech compression / expanding circuit 115, and a sound signal is changed into an analog sound signal by the voice codec 116, and generates voice from a loudspeaker 203. On the other hand, it is elongated via the signal distribution control circuit 110 in picture compression / expanding circuit 117, and a picture signal is once memorized by the image buffer memory 118, and is displayed on the liquid crystal display section 201 by the display drive circuit 203. Thus, if the circuit switched connection by the side of call origination and a call in is established, it can talk over the telephone, looking at the image picturized by the body section 400 of a camera in the liquid crystal display section 201.

[0042] (Gestalt of the 2nd operation) The case where the body section 400 of a camera is used in the condition of having separated from the body section 100 of telephone, as a.gestalt of the 2nd operation is explained.

[0043] Drawing 4 shows cross-section structural drawing when removing the body section of a camera in the gestalt of the 2nd operation by this invention from a hinge region.

[0044] In this case, as for the body section 400 of a camera, between the lightwave signal receiving-circuit sections 303 is connected with a fiber-optic cable 500. The cable maintenance material 501 is fixed and adhesion connection of one edge of a fiber-optic cable 500 is made with the FUKURO nut 502 at the camera case 401. Similarly, the other-end section of a fiber-optic cable is being fixed by the cable maintenance material 503, checking-and-verifying insertion is carried out to the light-receiving circuit section case 302, and adhesion connection of the cable maintenance material 503 is made with the FUKURO nut 504.

[0045] Thus, the photographic subject image caught with the image pick-up lens 403 of the body section 400 of a camera is projected on an image sensor 402, is changed into an electrical signal, the back, it is sent to the lightwave signal sending-circuit section 404, and becomes a lightwave signal, light is received by the photo detector of the lightwave signal receiving-circuit section 303 through a fiber-optic cable 500 from here, and it is again changed into an electrical signal, and is transmitted to the body section 100 of telephone.

[0046] (The 3rd example) The case where insert an extended memory card in the body section 100 of telephone, and image information or text information is transmitted as a gestalt of the 3rd operation is explained.

[0047] Drawing 5 is drawing showing the situation which uses an extended memory card in the pocket mold radio communication equipment with an image pick-up function in the gestalt of the 3rd operation by this invention.

[0048] In order to use such an extended memory card, as drawing 1 was shown, the slot 106 for

extended memory cards is formed in one side face of the body section 100 of telephone. For example, it is a card slot based on the criteria of JEIDA/PCMCIA of a book type personal computer. The extended memory card inserted in such a card slot is the thing of small size in the thin shape which has the capacity of several megabytes.

[0049] In order to write image information in this extended memory card, as shown in drawing 5, extended memory card 106a is inserted in the card slot 601 based on the criteria of JEIDA/PCMCIA of a book type personal computer 600, and necessary image information is written in and it inserts in the slot 106 for extended memory cards of the body section 100 of telephone.

[0050] Moreover, the cable splicing of the interface 108 for personal computer connection prepared in the body section 100 of telephone may be carried out to a book type personal computer 600, and the image information from a book type personal computer 600 may be transmitted to the internal memory 107 of the body section 100 of telephone.

[0051] If the image change key (not especially shown) which is one of the function keys 101 is pressed when sending the image information memorized by extended memory card 106a during the message to the other party, the central-process section 109 will detect the depression of the key, and will switch the signal root from the body section 400 of a camera for an image transfer to the slot 106 for extended memory cards to the signal distribution control circuit 110. Instead of the image pick-up image from the body section 400 of a camera, the image information of extended memory card 106a is transmitted to the other party by this. On the other hand, in order to save the image information transmitted from the other party at extended memory card 106a, in the signal distribution control circuit 110, the picture signal from voice and image multiplex / decomposition circuit 111 is distributed to the signal root to the liquid crystal display section 201, and the root to the slot 106 for extended memory cards. By this, a user can save to extended memory card 106a, looking at the image information transmitted from the other party in the liquid crystal display section 201.

[0052] Moreover, when transmitting to the other party while talking the image of an external personal computer over the telephone, the cable splicing of the connection interface 108 for personal computers of the body section 100 of telephone is carried out to an external personal computer, the signal root from the body section 400 of a camera is switched to an internal memory 106 in the signal distribution control circuit 110, and it carries out by incorporating the image information on the image memory of an external personal computer to an internal memory 107.

[0053]

[Effect of the Invention] As explained above, according to the pocket mold radio communication equipment by this invention, by having prepared the camera unit for an image image pick-up in the hinge region connected possible [ folding of the body section of telephone, and a covering device ] disengageable, it becomes unnecessary to newly prepare the device member for attaching the camera unit for an image image pick-up, enabling free rotation in the body section of telephone, or a covering device, and reduction of components mark and simplification of a configuration can be attained.

[0054] Moreover, adjustment is able for a user to double the image pick-up direction of a camera with a camera from the front to back in the other location, and to carry out easily.

[0055] Moreover, by having prepared the camera unit for an image image pick-up disengageable from the hinge region, by making the camera itself dismountable from the body of equipment, the image pick-up range of an image pick-up camera is expanded, and a message is made possible, transmitting and receiving [ it not only transmitting and receiving a user's image, but ] the image of a surrounding situation, goods, a document, etc.

[0056] Moreover, by establishing said expanded memory slot, image information or text information is made to memorize, and it can talk over the telephone, displaying image information required at any time or text information on the pocket mold radio communication equipment with an image pick-up function of the other party.

[0057] Moreover, it becomes possible by establishing the connection interface of an external personal computer to transmit to the other party at any time, talking the image information held in an external personal computer over the telephone.

[0058] Moreover, the image information transmitted from the pocket mold radio communication equipment with an image pick-up function of the other party can be transmitted to the memory of an external personal computer, and preservation and edit arrangement can be performed.

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TECHNICAL FIELD

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[Field of the Invention] This invention relates to the pocket mold radio communication equipment with an image pick-up function whose transmission and reception of an image and voice data are enabled.

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PRIOR ART

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[Description of the Prior Art] Recently, an image-processing circuit is sharply integrated by the advance of LSI technology, a miniaturization and low-power-ization are attained, and the product of the pocket mold by cordless-izing has been developed also in a TV phone machine. In the case of such a pocket mold, the structure which unified the telephone member for the alphabetic character and the micro CCD camera for the small liquid crystal display and image pick-up for the display of an image is taken.

[0003] For example, the walkie-talkie type TV telephone is proposed by JP,6-292197,A. In this walkie-talkie type TV telephone, the whole equipment is equipped with the flip section connected with the hinge, it changes into the condition of having laid on top of the top face of the body of equipment with said hinge, and this flip section can be closed. The top face of the body of equipment is equipped with the monitor, the CCD camera, and the loudspeaker. It talks over the telephone with a microphone, maintaining a fixed distance toward the aforementioned monitor, a CCD camera, and a loudspeaker, and checking a monitor by looking, when the flip section is opened.

[0004] Moreover, the cellular-phone one apparatus video camera is proposed by JP,8-294030,A. This cellular-phone one apparatus video camera carries in a case the video camera section which consists of an image pick-up lens and an image sensor, the graphic display section, and the cellular-phone function part which carries out the wireless transmission and reception of the message signal of a telephone.

[0005] Furthermore, the following two cases are indicated as the method of disposition of each of said component in a case.

[0006] While it consists of the 1st case which carries the loudspeaker of the video camera section and a cellular-phone function part, and the 2nd case carrying the microphone of the graphic display section, a control unit, and a cellular-phone function part in the case of the 1st and the 1st case is supported to revolve by the 2nd case pivotable centering on the horizontal axis of the 2nd case, the loudspeaker of the video camera section carried in the 1st case and a cellular-phone function part is a configuration arranged mutually in the location which carries out an abbreviation rectangular cross.

[0007] While consisting of a top case carrying the loudspeaker and microphone of the video camera section, the graphic display section, and a cellular-phone function part, and a control unit and the bottom case carrying a dc-battery in the case of the 2nd and connecting a top case and a bottom case rotatable, when a top case is rotated and it blockades, the field where the video camera section of a top case and the graphic display section were arranged is superimposed on the top face of a bottom case. The pocket mold TV phone is proposed by JP,9-327007,A further again. Two configurations are indicated by this proposal. With the 1st configuration, the camera for an image image pick-up was formed disengageable to the body of equipment, and while establishing the optical-communication means for transmitting and receiving image data between the body of equipment, and the camera unit for an image image pick-up, the image delivery system for projecting an image on the body of equipment and the projection direction adjustable means for carrying out adjustable [ of the direction which projects an image by the image delivery system ] are established in one. Moreover, the camera for an image image pick-up forms disengageable to the body of equipment, and while establishing the optical-communication means for transmitting and receiving image data between the body of equipment, and the camera unit for an image

image pick-up, with the 2nd configuration, the direction adjustment device of a camera which makes in agreement the optical axis of the camera for an image image pick-up in the direction with the body of equipment, and the angle-of-visibility adjustment device which make in agreement the core of the angle of visibility of the image-display section in the direction with the body of equipment prepare.

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[Translation done.]

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## EFFECT OF THE INVENTION

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[Effect of the Invention] As explained above, according to the pocket mold radio communication equipment by this invention, by having prepared the camera unit for an image image pick-up in the hinge region connected possible [ folding of the body section of telephone, and a covering device ] disengageable, it becomes unnecessary to newly prepare the device member for attaching the camera unit for an image image pick-up, enabling free rotation in the body section of telephone, or a covering device, and reduction of components mark and simplification of a configuration can be attained.

[0054] Moreover, adjustment is able for a user to double the image pick-up direction of a camera with a camera from the front to back in the other location, and to carry out easily.

[0055] Moreover, by having prepared the camera unit for an image image pick-up disengageable from the hinge region, by making the camera itself dismountable from the body of equipment, the image pick-up range of an image pick-up camera is expanded, and a message is made possible, transmitting and receiving [ it not only transmitting and receiving a user's image, but ] the image of a surrounding situation, goods, a document, etc.

[0056] Moreover, by establishing said expanded memory slot, image information or text information is made to memorize, and it can talk over the telephone, displaying image information required at any time or text information on the pocket mold radio communication equipment with an image pick-up function of the other party.

[0057] Moreover, it becomes possible by establishing the connection interface of an external personal computer to transmit to the other party at any time, talking the image information held in an external personal computer over the telephone.

[0058] Moreover, the image information transmitted from the pocket mold radio communication equipment with an image pick-up function of the other party can be transmitted to the memory of an external personal computer, and preservation and edit arrangement can be performed.

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## TECHNICAL PROBLEM

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[Problem(s) to be Solved by the Invention] However, when the flip section is opened in the case of what is indicated by JP,6-292197,A etc., it talks over the telephone with a microphone, maintaining a fixed distance toward a monitor, a CCD camera, and a loudspeaker, and checking a monitor by looking, but since the CCD camera is arranged on the front face of the flip section, the situation where the other location must be changed into a CCD camera according to the aperture condition of the flip section produces a user. Moreover, when it was going to picturize objects other than a user's image, the whole equipment had to be operated for turning a CCD camera to an object, therefore there was a problem of being hard coming to carry out a message.

[0009] Moreover, in the case of what is indicated by JP,8-294030,A etc., with the 1st configuration, there was a problem of becoming complicated, also from the field of device design that the location of the microphone to be used and a loudspeaker changes according to the image pick-up direction of a camera, or operability.

[0010] Moreover, when the 2nd configuration opens a top case by the hinge region to a bottom case, the configuration by which the video camera section and the graphic display section are arranged on the top face of a top case is fundamentally the same as that of the case of JP,6-292197,A, and produces the same problem.

[0011] In the case of what is indicated by JP,9-327007,A etc., with the body of equipment, the camera unit is prepared in another object and the time and effort that it must carry with another object with the main frame will produce it further again at the time of carrying. Moreover, if a camera unit is held in the same case as the graphic display section and wearing of it in a part of a user's body is enabled, it cannot but stop miniaturizing the graphic display section to some extent, and will become hard to see.

[0012] It was made in order to solve the above problems, and a user doubles the image pick-up direction of a camera with a camera from the front to back in the other location, and this invention can be easily carried out by adjustment. By making the camera itself dismountable from the body of equipment, the image pick-up range of an image pick-up camera is expanded, and it aims at offering the pocket mold radio communication equipment which makes a message possible, transmitting and receiving [ it not only transmitting and receiving a user's image, but ] the image of a surrounding situation, goods, a document, etc.

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EXAMPLE

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(The 3rd example) The case where insert an extended memory card in the body section 100 of telephone, and image information or text information is transmitted as a gestalt of the 3rd operation is explained.

[0047] Drawing 5 is drawing showing the situation which uses an extended memory card in the pocket mold radio communication equipment with an image pick-up function in the gestalt of the 3rd operation by this invention.

[0048] In order to use such an extended memory card, as drawing 1 was shown, the slot 106 for extended memory cards is formed in one side face of the body section 100 of telephone. For example, it is a card slot based on the criteria of JEIDA/PCMCIA of a book type personal computer. The extended memory card inserted in such a card slot is the thing of small size in the thin shape which has the capacity of several megabytes.

[0049] In order to write image information in this extended memory card, as shown in drawing 5, extended memory card 106a is inserted in the card slot 601 based on the criteria of JEIDA/PCMCIA of a book type personal computer 600, and necessary image information is written in and it inserts in the slot 106 for extended memory cards of the body section 100 of telephone.

[0050] Moreover, the cable splicing of the interface 108 for personal computer connection prepared in the body section 100 of telephone may be carried out to a book type personal computer 600, and the image information from a book type personal computer 600 may be transmitted to the internal memory 107 of the body section 100 of telephone.

[0051] If the image change key (not especially shown) which is one of the function keys 101 is pressed when sending the image information memorized by extended memory card 106a during the message to the other party, the central-process section 109 will detect the depression of the key, and will switch the signal root from the body section 400 of a camera for an image transfer to the slot 106 for extended memory cards to the signal distribution control circuit 110. Instead of the image pick-up image from the body section 400 of a camera, the image information of extended memory card 106a is transmitted to the other party by this. On the other hand, in order to save the image information transmitted from the other party at extended memory card 106a, in the signal distribution control circuit 110, the picture signal from voice and image multiplex / decomposition circuit 111 is distributed to the signal root to the liquid crystal display section 201, and the root to the slot 106 for extended memory cards. By this, a user can save to extended memory card 106a, looking at the image information transmitted from the other party in the liquid crystal display section 201.

[0052] Moreover, when transmitting to the other party while talking the image of an external personal computer over the telephone, the cable splicing of the connection interface 108 for personal computers of the body section 100 of telephone is carried out to an external personal computer, the signal root from the body section 400 of a camera is switched to an internal memory 106 in the signal distribution control circuit 110, and it carries out by incorporating the image information on the image memory of an external personal computer to an internal memory 107.

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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] Drawing showing the condition of having opened the covering device of the pocket mold radio communication equipment with an image pick-up function in the gestalt of operation of the 1st of this invention

[Drawing 2] Cross-section structural drawing of the hinge region of the pocket mold radio communication equipment with an image pick-up function in the gestalt of operation of the 1st of this invention

[Drawing 3] The block diagram showing the whole pocket mold radio-communication-equipment configuration with an image pick-up function in the gestalt of 1 operation of this invention

[Drawing 4] Cross-section structural drawing when removing the body section of a camera of the pocket mold radio communication equipment with an image pick-up function in the gestalt of operation of the 2nd of this invention from a hinge region

[Drawing 5] Drawing showing the situation which uses an extended memory card in the pocket mold radio communication equipment with an image pick-up function in the gestalt of the 3rd operation by this invention

[Description of Notations]

- 100 Body Section of Telephone
- 101 Function Key
- 102 Scrolling Key
- 103 Input Control Unit
- 104 Microphone
- 105 Electric Power Switch
- 106 Slot for Extended Memory Cards
- 107 Internal Memory
- 108 Interface for Personal Computer Connection
- 109 Central Processing Unit
- 110 Signal Distribution Control Circuit
- 111 Voice and Image Multiplex / Decomposition Circuit
- 112 Baseband Signaling Processing Section
- 113 Strange Demodulator Circuit
- 114 RF Circuit
- 115 Speech Compression / Expanding Circuit
- 116 Voice Codec
- 117 Picture Compression / Expanding Circuit
- 118 Image Buffer Memory
- 200 Covering Device
- 201 Liquid Crystal Display Section
- 202 Display Drive Circuit

203 Loudspeaker  
204 Antenna  
300 Hinge Region  
301 Hinge Rotation Shaft  
302 Lightwave Signal Receiving-Circuit Section Case  
303 Lightwave Signal Receiving-Circuit Section  
400 Body Section of Camera  
401 Camera Case  
402 Image Sensor  
403 Image Pick-up Lens  
404 Lightwave Signal Sending-Circuit Section  
405 Cell  
500 Fiber-optic Cable  
501 Cable Maintenance Material  
502 FUKURO Nut  
503 Cable Maintenance Material  
600 Personal Computer

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[Translation done.]

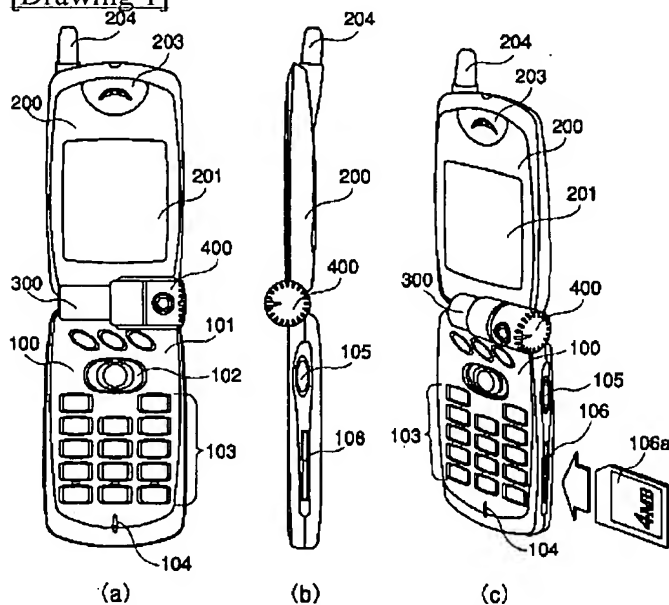
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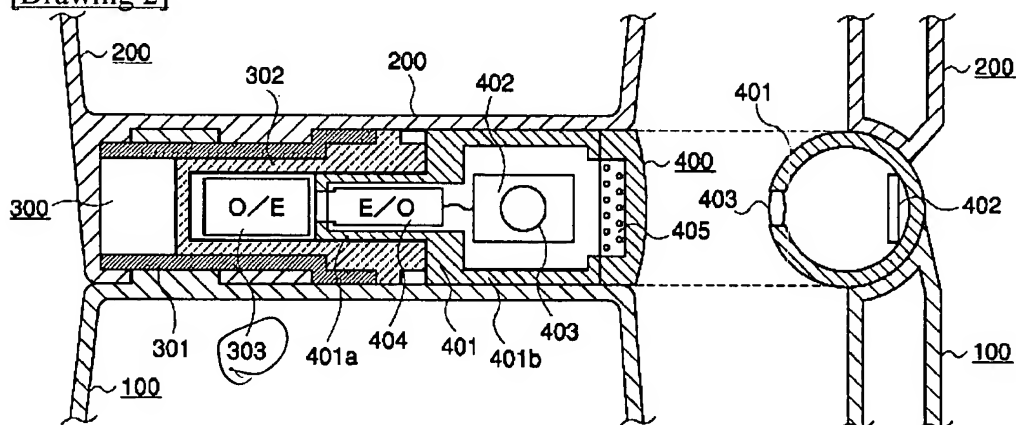
## DRAWINGS

[Drawing 1]

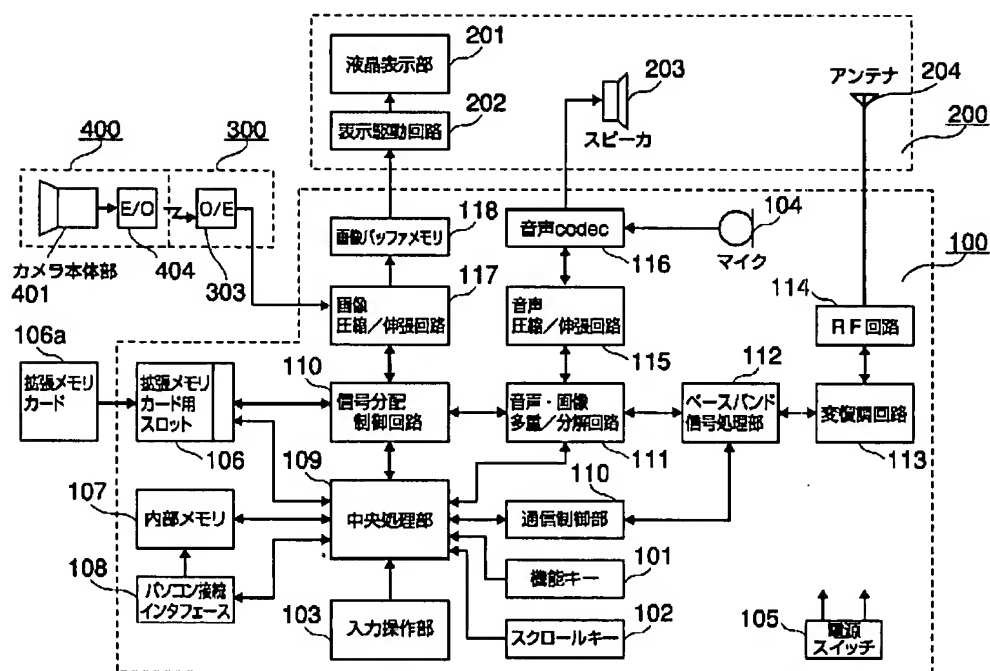


102: Scrolling Key

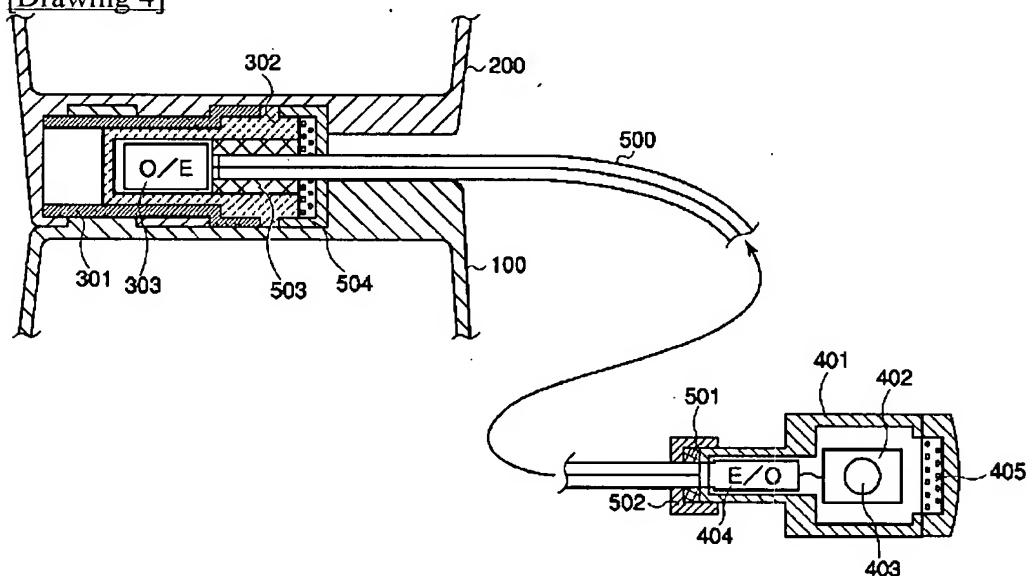
[Drawing 2]



[Drawing 3]

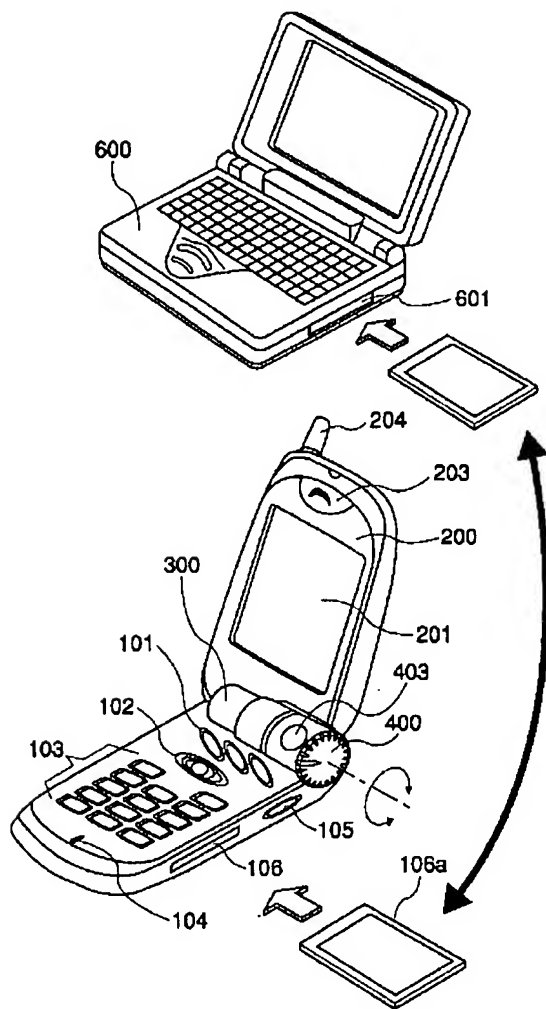


[Drawing 4]



[Drawing 5]





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[Translation done.]